# LG VACUUM CIRCUIT BREAKERS

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LG Industrial Systems

# LG VACUUM CIRCUIT BREAKERS

ISO 9001, ISO 1

LG Vacuum Circuit Breakers

LVB Series

# Features

## LVB Series has the following features

### Compact size and light weight

LVB series VCB, having a shorter stroke breaking mechanism compared with other VCBs, is small in size and light weight.

### Increased safety and maintenance free

For insulation, the control part is in the front section and the interrupting part is in the rear section of the mold frame, which gives high safety. VI has a contact-wear indicator that informs you of the replacement time.

### Motor spring charging type

Due to the motor charging operation, closing time is steady regardless of the control voltage and it is mechanically and electrically stable.

### High interrupting capacity

Implementing a unique design principal (the arc is driven around the contact surface as it is being extinguished), it has high insulation recovery characteristics and therefore it interrupts the arc in a short time from small current through short circuit current.

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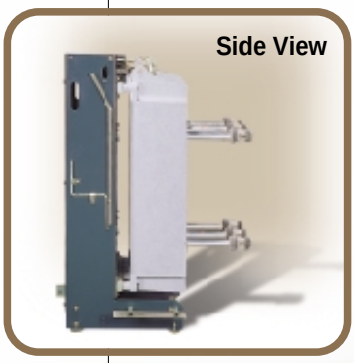
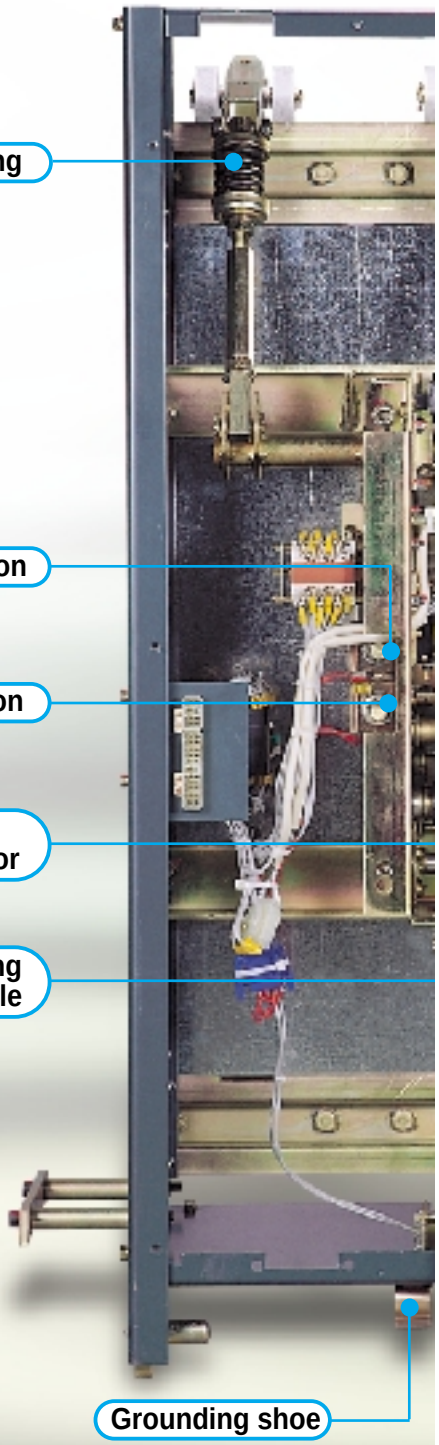
# Construction

## V C B



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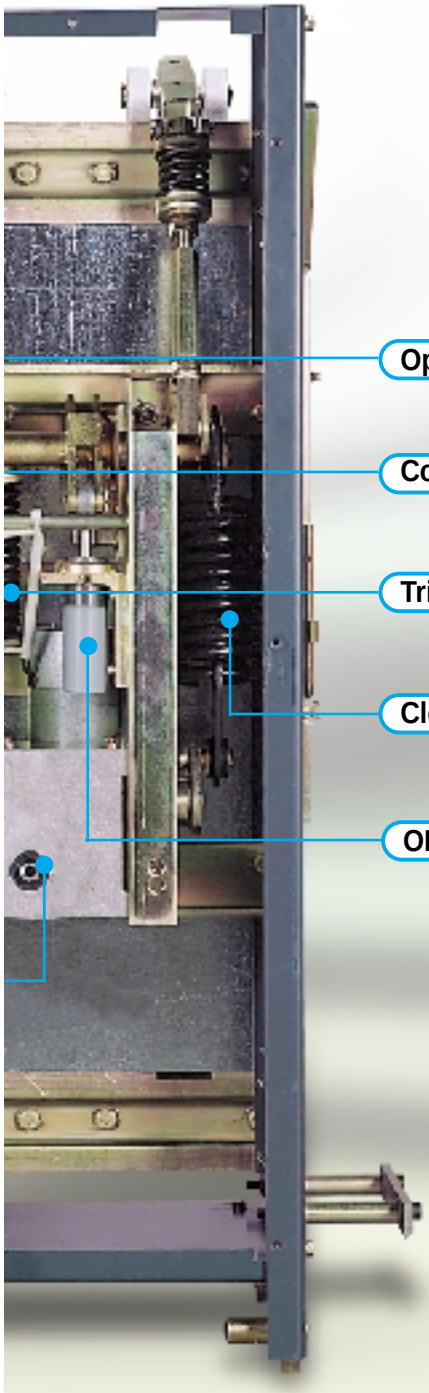


## Cradle

E Type

F Type

G Type

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# Specifications

| Type | | LVB-6□-8A | | LVB-6□-13A | | LVB-6□-20A | | LVB-6□-25A | |
|---|---|---|---|---|---|---|---|---|---|
| Rated voltage(kV) | | 7.2 | 3.6 | 7.2 | 3.6 | 7.2 | 3.6 | 7.2 | 3.6 |
| Rated current(A) | | 400 | | 630 | | 630<br>1250<br>2000 | | 630<br>1250<br>2000 | |
| Rated frequency(Hz) | | 50 / 60 | | | | | | | 50 / 6 |
| Rated interrupting current(kA) | | 8 | | 12.5 | | 20 | | 25 | |
| Rated interrupting capacity(MVA) | | 100 | 50 | 160 | 80 | 250 | 125 | 320 | 160 |
| Rated making current(kA) | | 20 | | 31.5 | | 50 | | 63 | |
| Rated short time current(kA /1sec) | | 8 | | 12.5 | | 20 | | 25 | |
| Rated opening time(sec) | | 0.05 | | | | | | | 0.0 |
| Rated interrupting time(Cycle) | | 5 | | | | | | | 5 |
| Closing time at no load(sec) | | 0.1 | | | | | | | 0.1 |
| Withstand voltage(kV) | Frequency(1min) | 20 | | | | | | | 20 |
| | Impulse(1.2 ×50 μs) | 60 | | | | | | | 60 |
| Operating duty | | CO-15s-CO, O-3min-CO-3min-CO | | | | | | | CO-15s- |
| Closing operation current(at DC 110V)(A) | Motor | 0.4 | | | | | | | 3.8 |
| | Coil | 3 | | | | | | | 2.5 |
| Tripping conrtol current(at DC 110V)(A) | | 1 | | | | | | | 2.5 |
| Life Expectancy (Operation) | Electrical | 10000 | | | | | | | 1000 |
| | Mechanical | 10000 | | | | | | | 1000 |
| Auxiliary s / w(standard) | | 2a2b | | | | | | | 5a4b |
| Weight(kg) | | 38 | | 40 | | 65(630A)<br>70(1250A)<br>180(2000A) | | | |
| Installation types * | | P,E,F,G | | | | | | | P,E,F, |
| Standard | | IEC Pub.56 | | | | | | | IEC Pub |

**NOTE :** * For installation type refer to page 22, 23.
* For 5, 12, 15kV contact the manufacturer.

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| LVB-6□-32A | | LVB-6□-40A | | LVB-20□-13A | LVB-20□-25A | LVB-25M-25A |
|---|---|---|---|---|---|---|
| 2 | 3.6 | 7.2 | 3.6 | 24 | 24 | 25.8 |
| 1250<br>2000<br>3150 | | 1250<br>2000<br>3150 | | 630<br>1250 | 630<br>1250<br>2000 | 600<br>2000 |
| | | | | 50 / 60 | | 50 / 60 |
| 31.5 | | 40 | | 12.5 | 25 | 25 |
| 0 | 195 | 500 | 250 | 520 | 1000 | 1000 |
| 80 | | 100 | | 31.5 | 63 | 63 |
| 31.5 | | 40 | | 12.5 | 25 | 25 |
| | | | | 0.04 | | 0.04 |
| | | | | 5 | 3.5 | 5 |
| | | | | 0.1 | | 0.1 |
| | | | | 50 | | 50 |
| | | | | 125 | | 125 |
| -3min-CO-3min-CO | | | | O-0.3s-CO-3min-CO | | O-0.3s-CO-3min-CO,O-3min-CO-3min-CO,CO-15s-CO |
| | | | | 5 | | 5 |
| | | | | 2.5 | | 2.5 |
| | | | | 2.5 | | 2.5 |
| | | | | 10000 | | 10000 |
| | | | | 10000 | | 10000 |
| | | | | 4a4b | | 10a10b |
| 115(1250A)<br>160(2000A)<br>200(3150A) | | 130(1250A)<br>175(2000A)<br>200(3150A) | | 260(630A)<br>280(1250A) | 280(630A)<br>280(1250A)<br>350(2000A) | 320(600A)<br>350(2000A) |
| | | | | P, E, F, G | | M |
| | | | | IEC Pub.56 | | IEC Pub.56 |

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# Vacuum Interrupter / Wiring Diagram

## Vacuum Interrupter

### Structure

The internal components of a typical vacuum interrupter are shown in Fig 1.
LG Vacuum Interrupter consists of a ceramic insulator, two end plates,
arc shield, bellows, a movable and a fixed electrode, and contacts set, etc.
The ambient gas pressure within the evacuated tube is approximately $10^{-6}$torr.

Fig1. Vacuum interrupter Schematic.

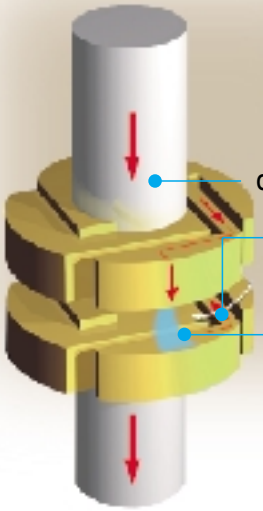


Fig 2.
Current flow and driving force on arc for spiral contact

### Features

- Small size and light weight.
- High performance, reliability and long life are assured.
- Maintains high vacuum.
- High-alumina ceramics provide superior mechanical strength and easy degassing.
- High speed interrupter can meet all IEC, ANSI and NEMA performance standards.
- When a fault occur, the arc is rapidly moved around the slotted contacts surface by self induced magnetic effects, preventing gross contact erosion and the formation of hot spot on the surface.
  At current zero the arc is extinguished and vapor production is ceased.
  The metal vapor plasma is very rapidly dispersed,cooled, recombined and deionized and the metal vapor products are quickly condensed so that the contacts withstand the transient recovery voltage.

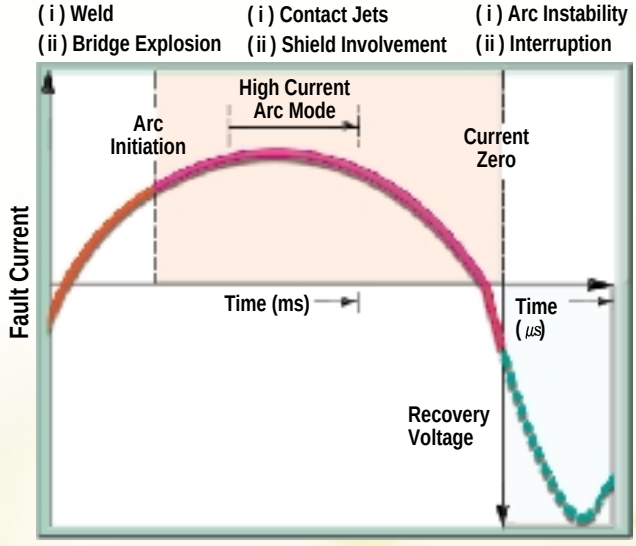


Fig3. AC arcing and interruption phenomena in vacuum.

Voltage Phenomena
(i) Arc Reignition
(ii) Restrikes
(iii) B. I. L
(iV) AC Voltage Withstand



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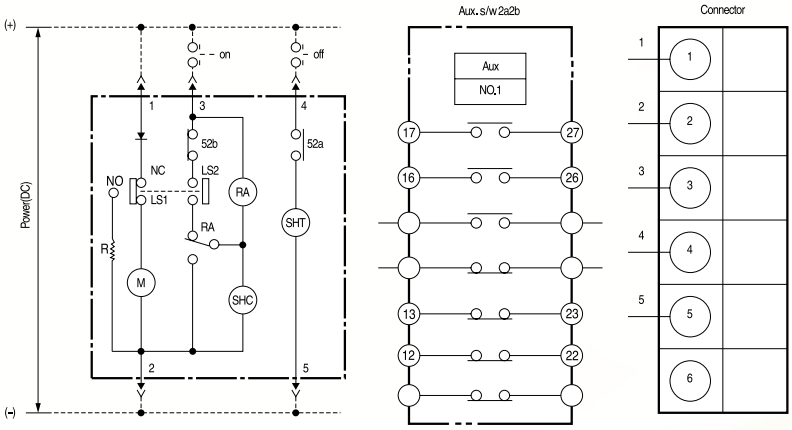
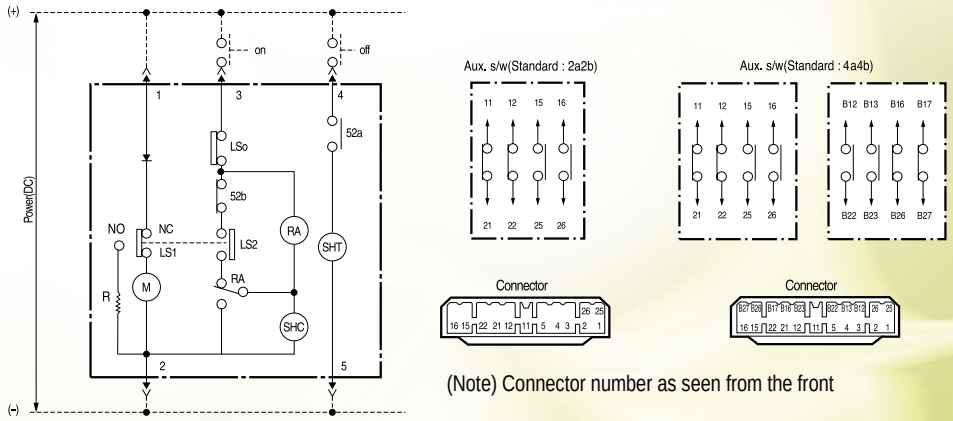
# Wiring Diagram

## LVB-6P-8A / 13A



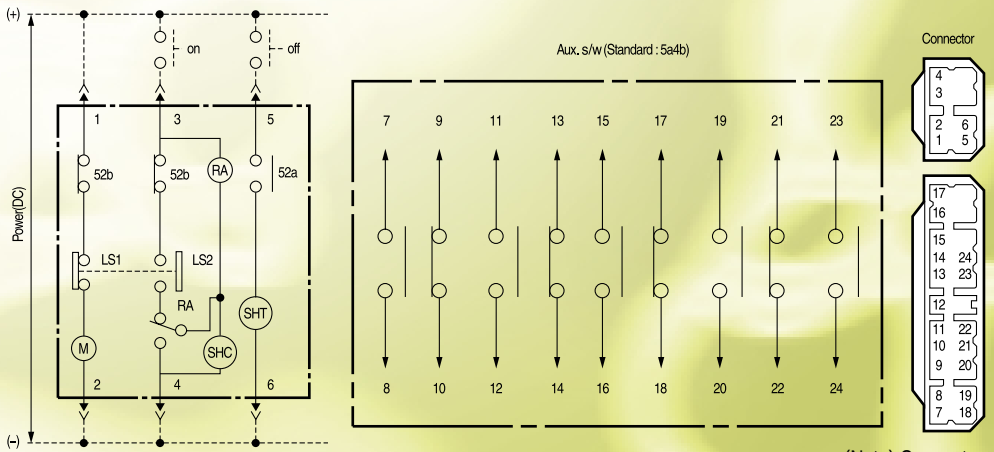

(Note) Aux. s/w and connector is installed in the right side of a VCB

## LVB-6EFG-8A /13A




(Note) Connector number as seen from the front

## LVB-6PEFG-20A / 25A / 32A / 40A




(Note) Connector number as seen from the front

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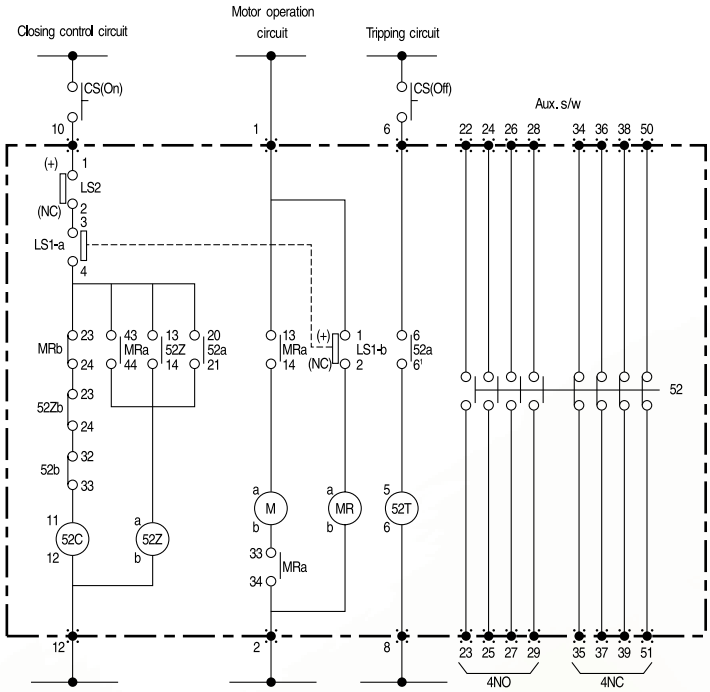
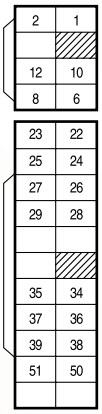
# Wiring Diagram

## LVB-20PE,PG-13A/25A

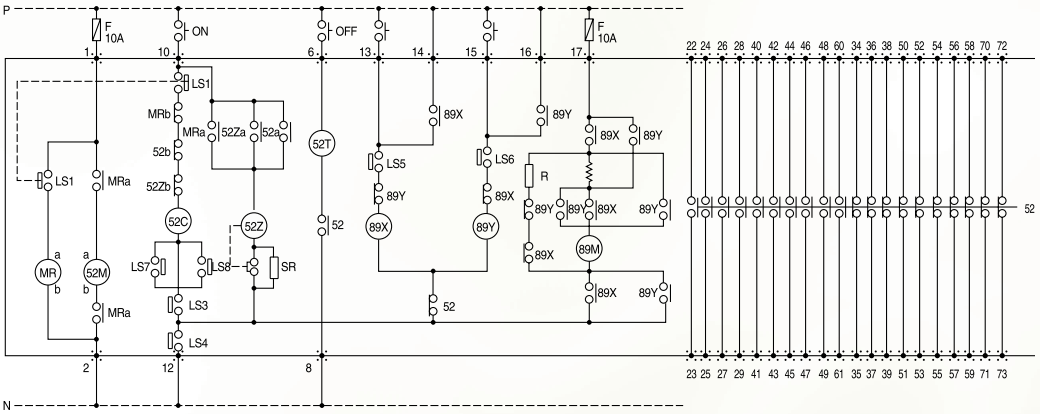


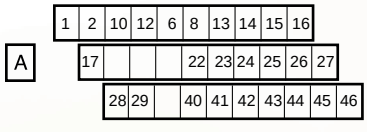
: Output terminal
52a : Aux. s/w (a contact)
52b : Aux. s/w (b contact)
52Z : Aux. Relay (for Anti-pumping)
52C : Closing coil
52T : Trip coil
M : Operational motor
MR : Aux. Relay (for motor)
LS : Limit s/w
CS : Control s/w

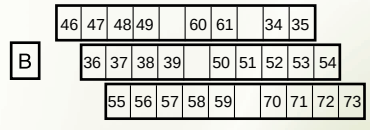
(Note) Connector number as seen from the front

## LVB-25M-25A




52M : Motor for spring charging
52a : Aux. s/w (a contact)
52b : Aux. s/w (b contact)
52Z : Aux. Relay (for Anti-pumping)
52C : Closing coil
52T : Shunt trip coil
MR : Aux. Relay (for motor)
LS : Limit s/w
CS : Control s/w
89X,Y : Aux. contactor
89M : Draw-out motor (for manual operation)
R : Resistance (for braking)




(Note) Connector number as from the back.

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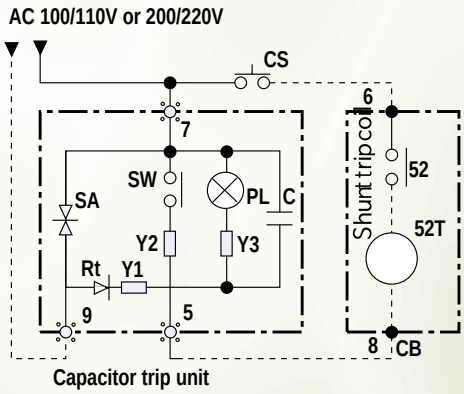
# Optional Accessories

## Condenser Trip Device

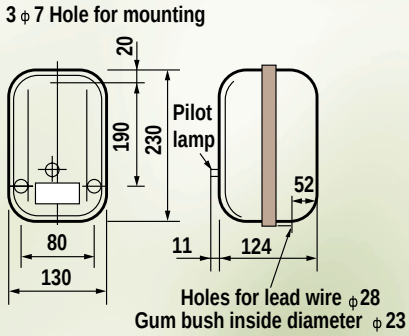
The standard power supply of the tripping circuit is DC.
If you have only AC power, the CTD converts the AC power to DC.

| Type | VCB-T1 | VCB-T2 |
|---|---|---|
| Input Voltage | 100 / 110V AC | 200 / 220V AC |
| Effective time for tripping | Within 30 sec after AC power interruption | |
| CB Shunt trip voltage | 100V DC | 200V DC |

### Connection Diagram




### Dimension

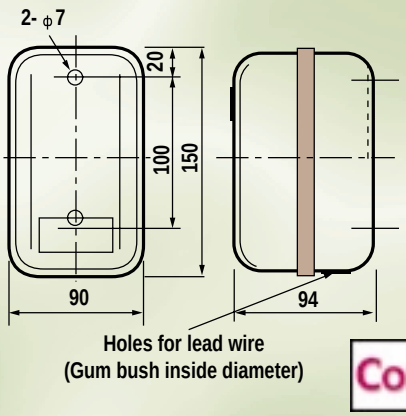



## Rectifier Device

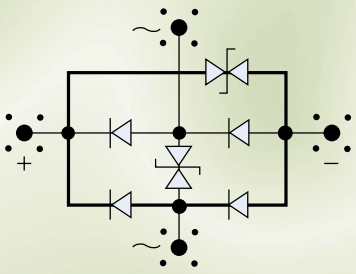
When the power supply of the closing circuit is AC,
the Rectifier Device is used.

| Type | AC Input Voltage | DC Output Current | Rating Time |
|---|---|---|---|
| VCB-X | 1 ϕ 100/110V<br>or<br>1 ϕ 200/220V | 40A /<br>Short time ratings | 10sec |

### Dimensi




### Connection

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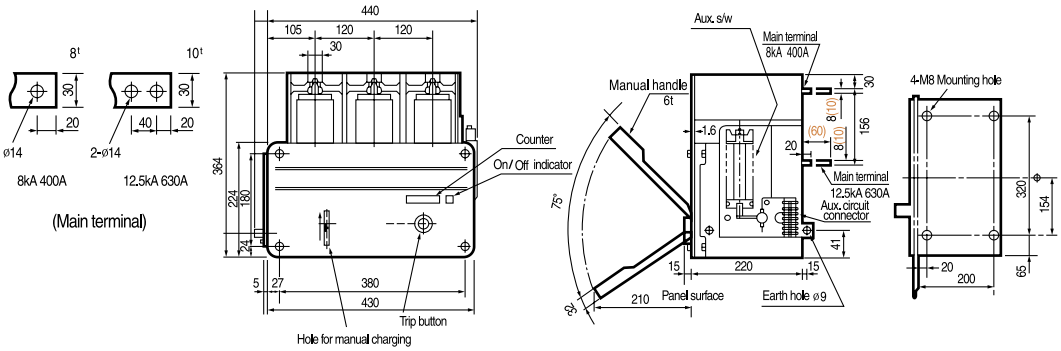
# External Dimensions

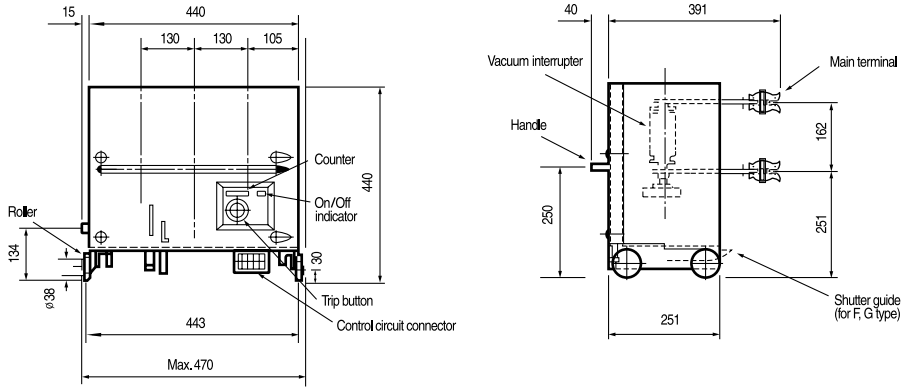
## 7.2kV 8/12.5kA 400/630A

### P Type

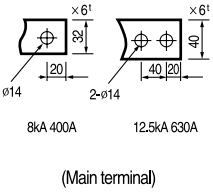


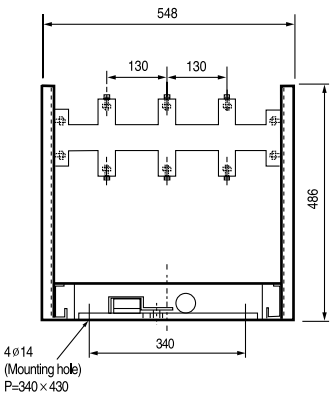

(Note) ( )12.5kA Dimensions.

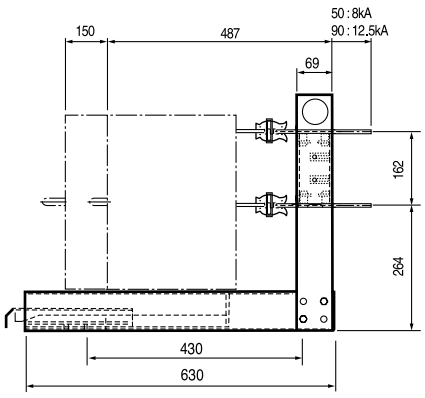
### E F G Type




### E Type cradle

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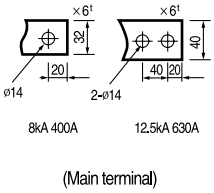
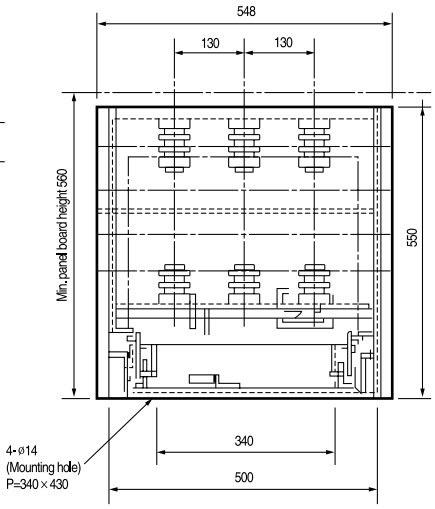
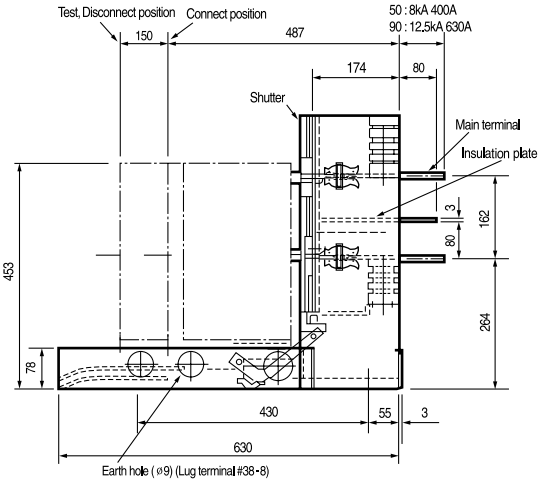
## F Type cradle




(Main terminal)

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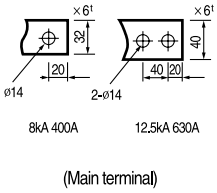
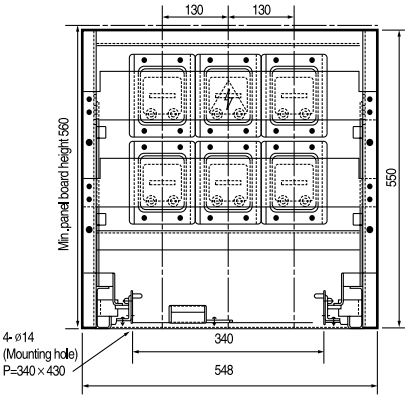
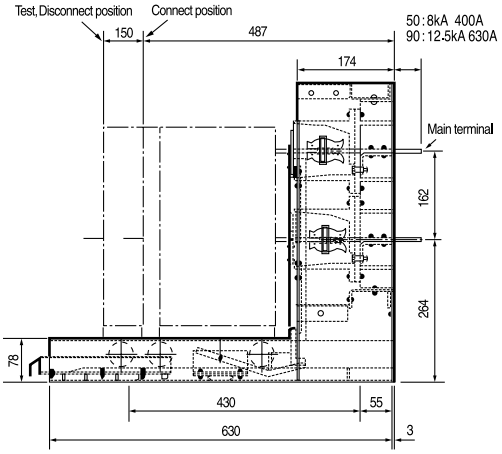


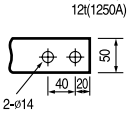

(Main terminal)



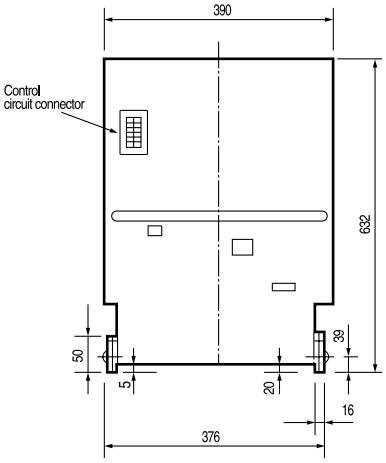



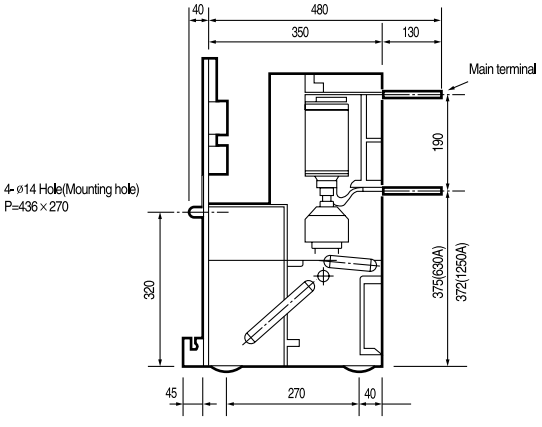

**7.2kV 20/25kA**

## P Type




(Main terminal)

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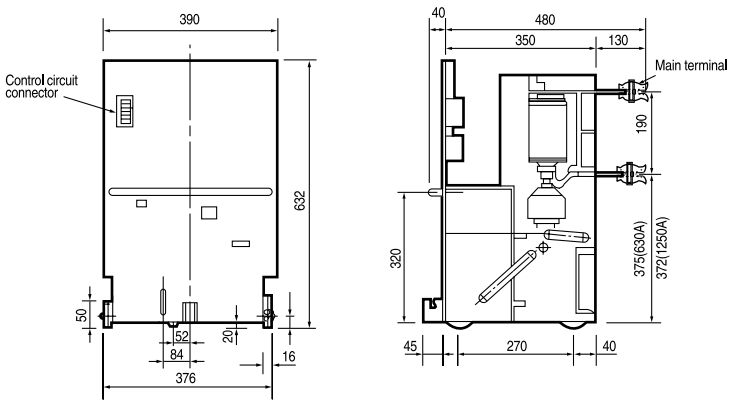
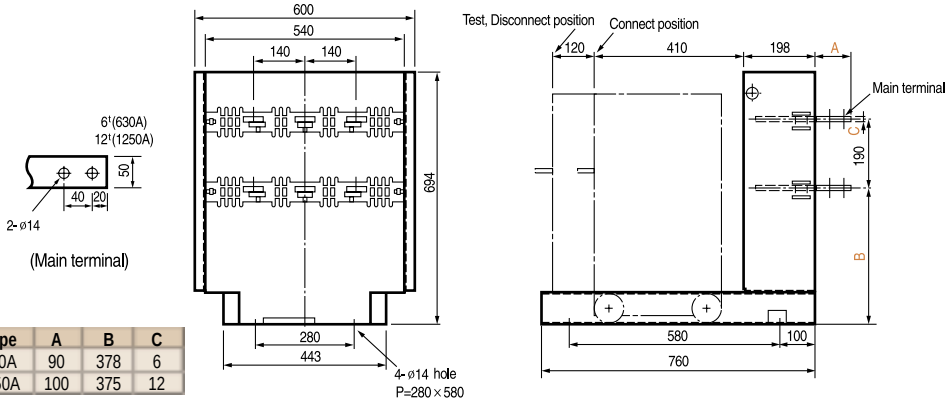
# External Dimensions

## E F G Type

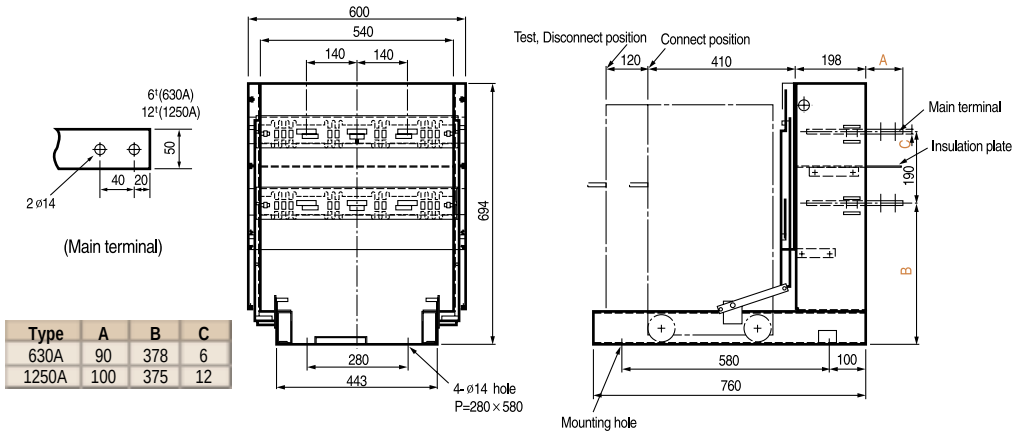



## E Type cradle




| Type | A | B | C |
|---|---|---|---|
| 630A | 90 | 378 | 6 |
| 1250A | 100 | 375 | 12 |

## F Type cradle




| Type | A | B | C |
|---|---|---|---|
| 630A | 90 | 378 | 6 |
| 1250A | 100 | 375 | 12 |

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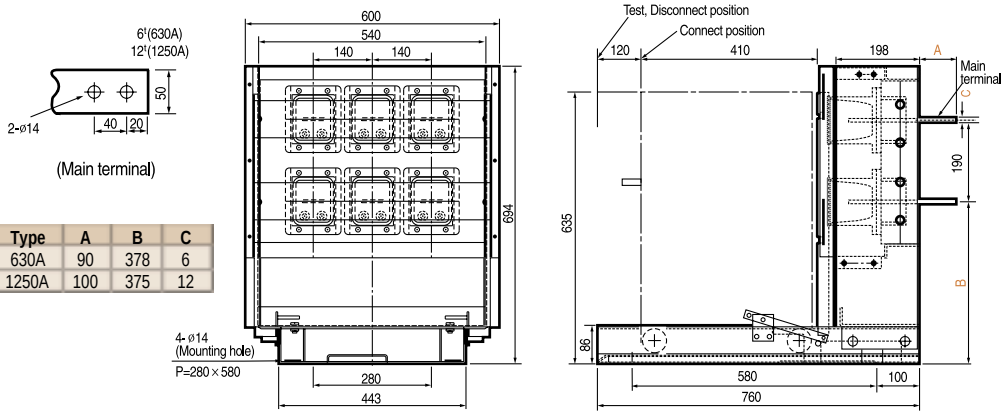
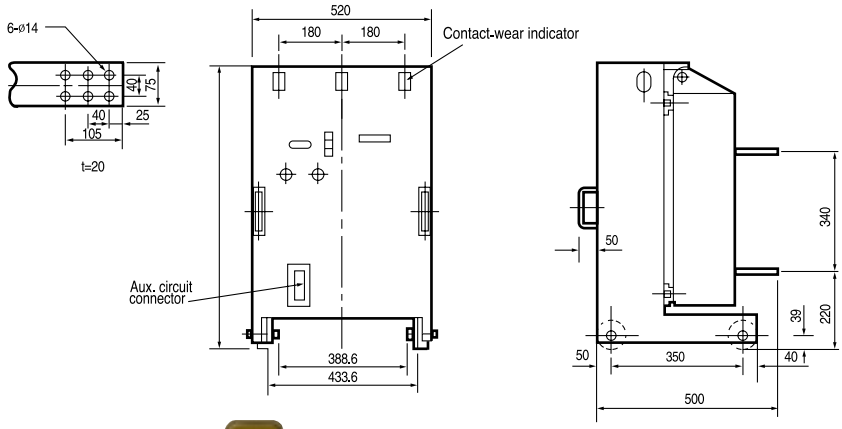
## G Type cradle



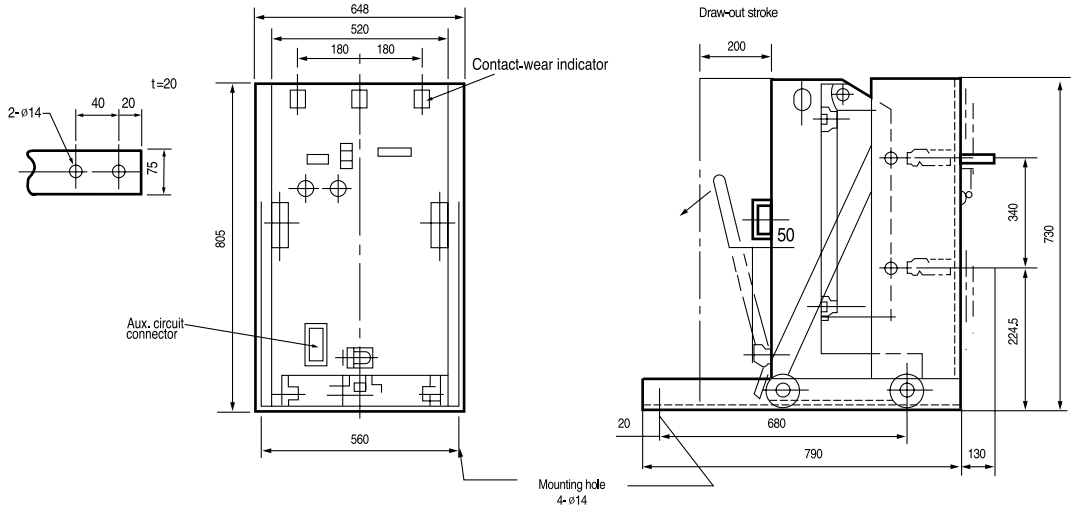

| Type | A | B | C |
|---|---|---|---|
| 630A | 90 | 378 | 6 |
| 1250A | 100 | 375 | 12 |

7.2kV 20/25kA 2000A

## P Type




## E Type

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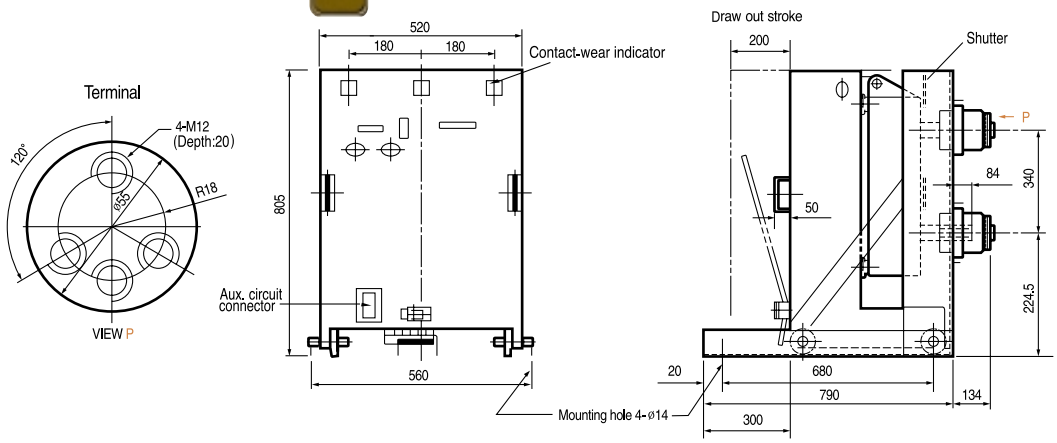
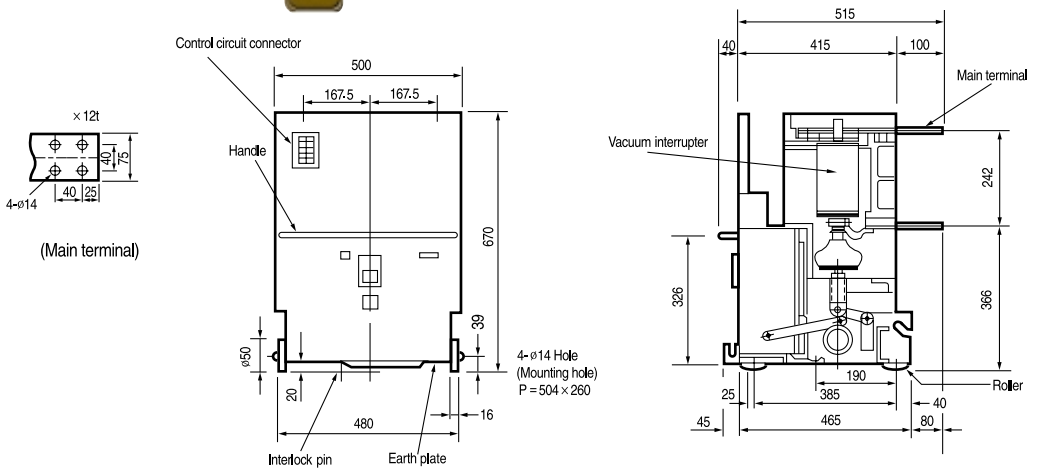
# External Dimensions

## G Type



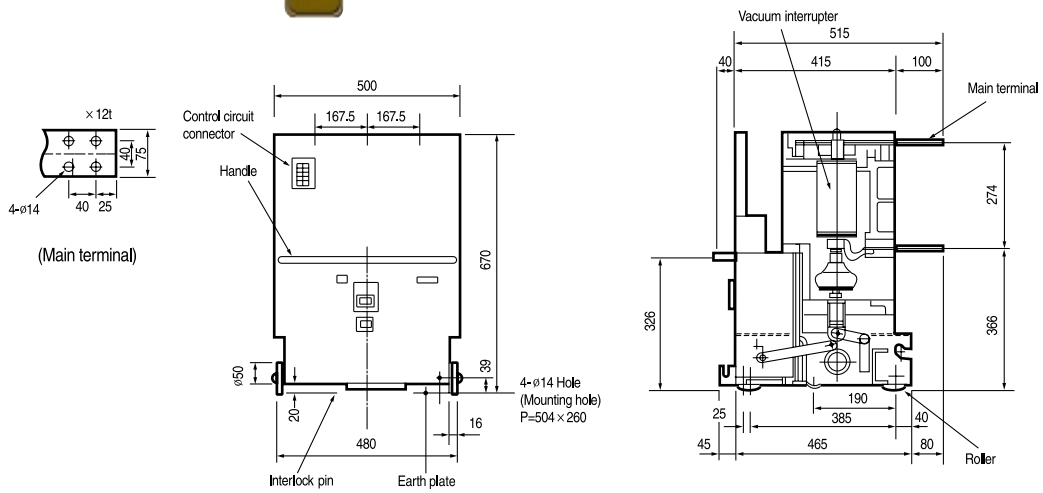

**7.2kV 31.5kA 2000A**

## P Type




**7.2kV 40kA 1250A**

## P Type

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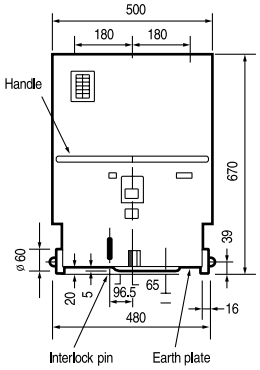
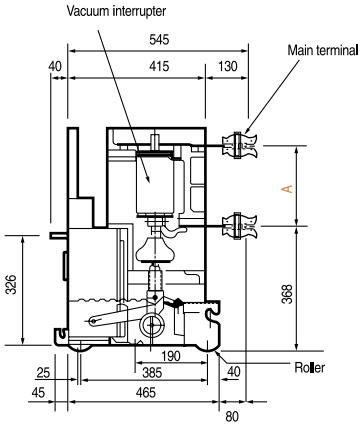
# 7.2kV 31.5/40kA 1250A

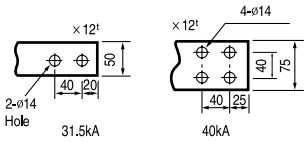
## E F G Type

| Type | A |
|---|---|
| 31.5kA | 242 |
| 40kA | 274 |



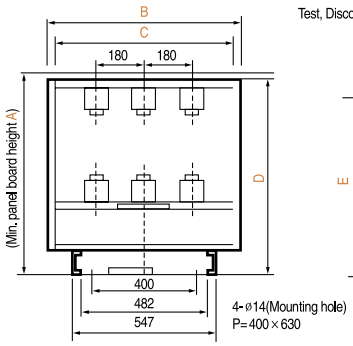

## E Type cradle

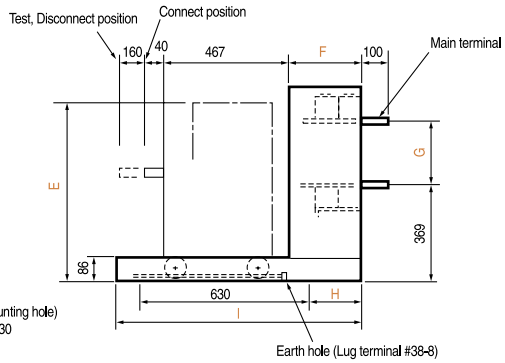



(Main terminal)

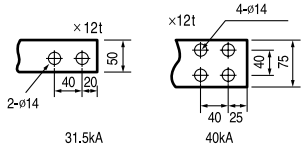
| Type | A | B | C | D |
|---|---|---|---|---|
| 6E-32A | 770 | 660 | 600 | 737 |
| 6E-40A | 800 | 680 | 620 | 770 |

| E | F | G | H | I |
|---|---|---|---|---|
| 674 | 186 | 242 | 100 | 830 |
| 694 | 271 | 274 | 185 | 915 |



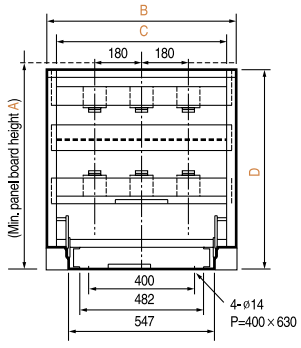

## F Type cradle

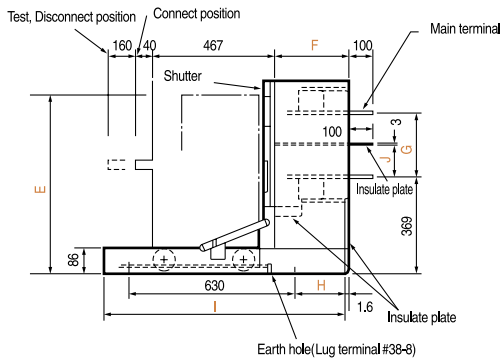



(Main terminal)

| Type | A | B | C | D |
|---|---|---|---|---|
| 31.5kA | 770 | 660 | 600 | 737 |
| 40kA | 800 | 680 | 620 | 770 |

| E | F | G | H | I | J |
|---|---|---|---|---|---|
| 674 | 186 | 242 | 100 | 830 | 120 |
| 694 | 271 | 274 | 185 | 915 | 136 |

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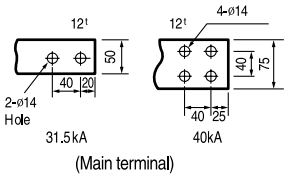
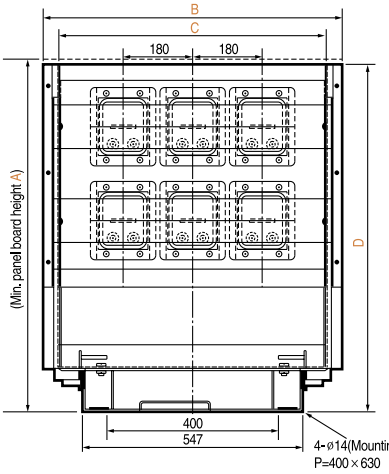
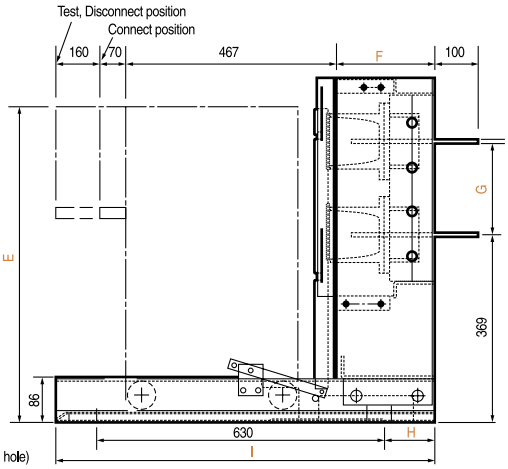
# External Dimensions

## G Type cradle



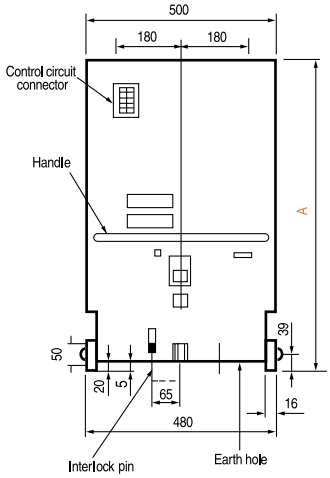



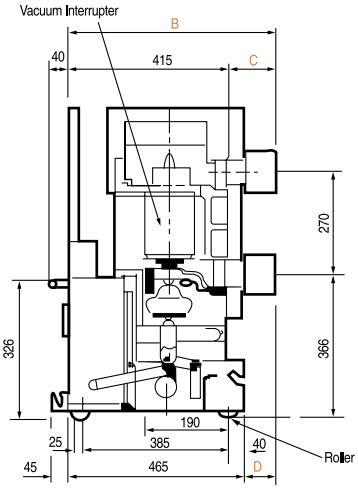

| Type | A | B | C | D |
|---|---|---|---|---|
| 31.5kA | 770 | 660 | 600 | 737 |
| 40kA | 800 | 680 | 620 | 770 |

| E | F | G | H | I |
|---|---|---|---|---|
| 674 | 186 | 242 | 100 | 830 |
| 694 | 271 | 274 | 185 | 915 |

**7.2kV 31.5/40kA 2000/3150A**

## E F G Type




| Type | A | B | C | D |
|---|---|---|---|---|
| 31.5kA | 770 | 660 | 600 | 737 |
| 40kA | 800 | 680 | 620 | 770 |

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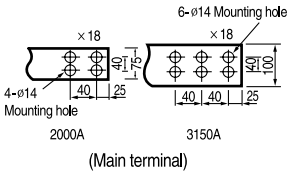
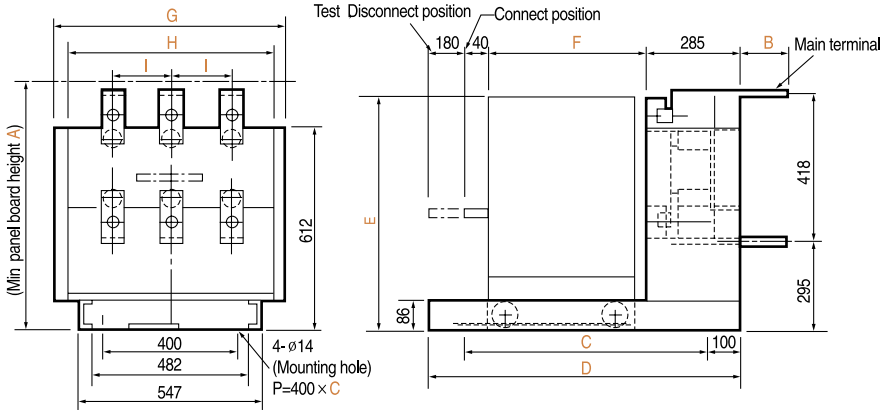
## E Type cradle

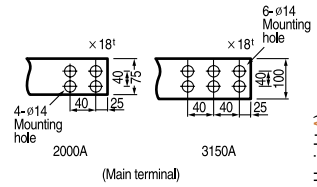



| Type | A | B | C | D |
|---|---|---|---|---|
| 2000A | 830 | 150 | 740 | 940 |
| 3150A | 870 | 200 | 830 | 1030 |

| E | F | G | H | I |
|---|---|---|---|---|
| 774 | 483 | 700 | 640 | 180 |
| 814 | 573 | 720 | 660 | 190 |

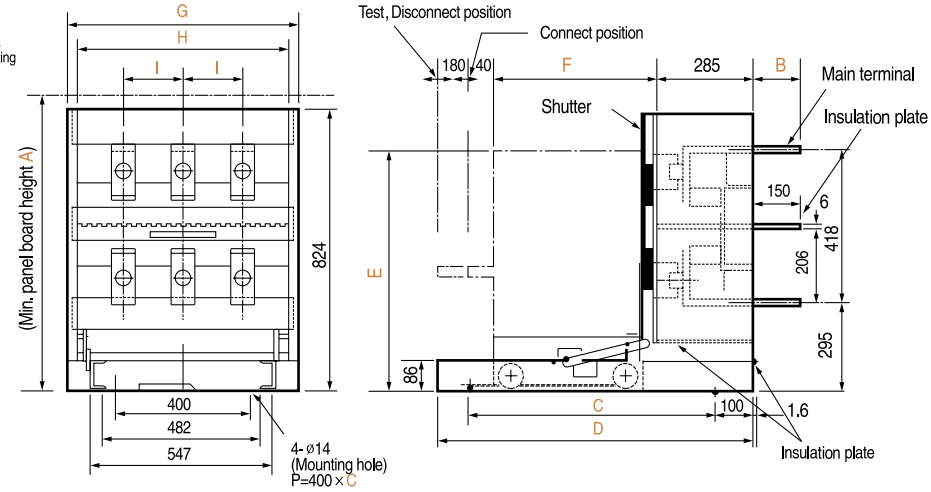



## F Type cradle

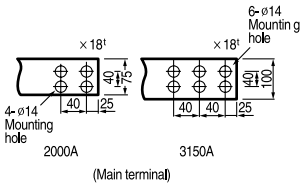



| Type | A | B | C | D |
|---|---|---|---|---|
| 2000A | 830 | 150 | 740 | 940 |
| 3150A | 870 | 200 | 830 | 1030 |

| E | F | G | H | I |
|---|---|---|---|---|
| 774 | 483 | 700 | 640 | 180 |
| 814 | 573 | 720 | 660 | 190 |

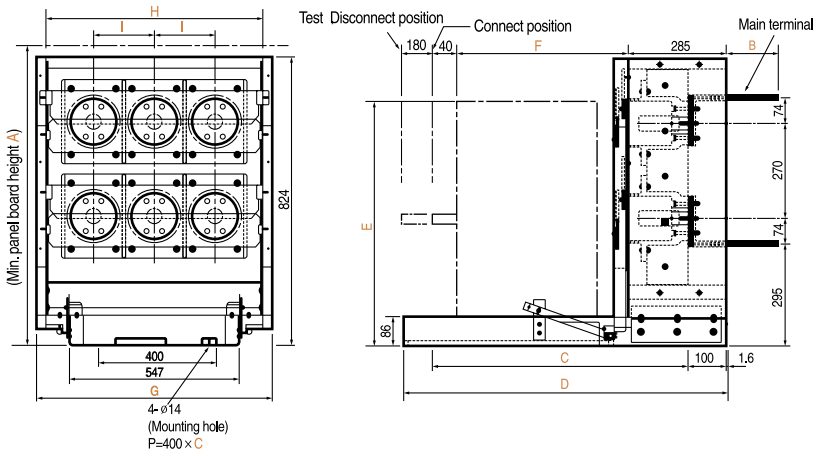



## G Type cradle




| Type | A | B | C | D |
|---|---|---|---|---|
| 2000A | 830 | 150 | 740 | 940 |
| 3150A | 870 | 200 | 830 | 1030 |

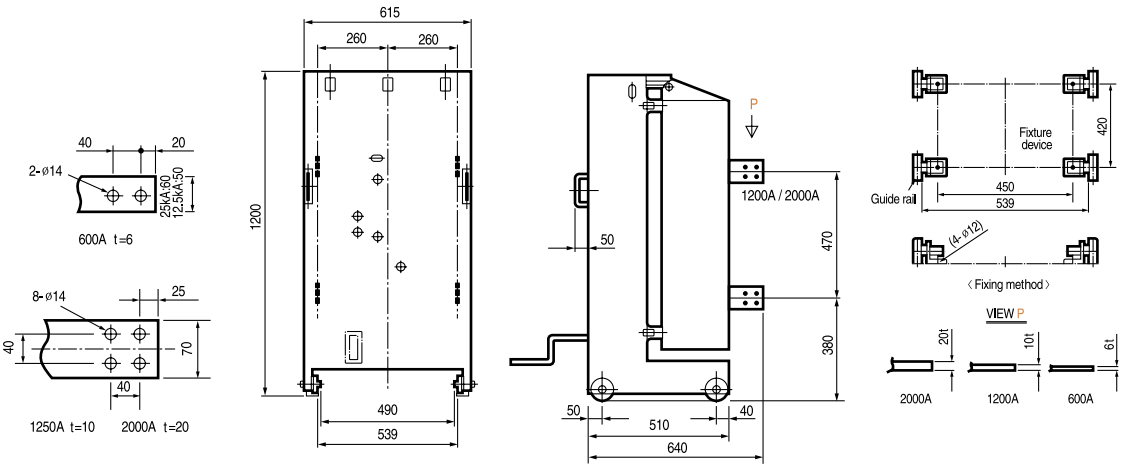
| E | F | G | H | I |
|---|---|---|---|---|
| 774 | 483 | 700 | 640 | 180 |
| 814 | 573 | 720 | 660 | 190 |



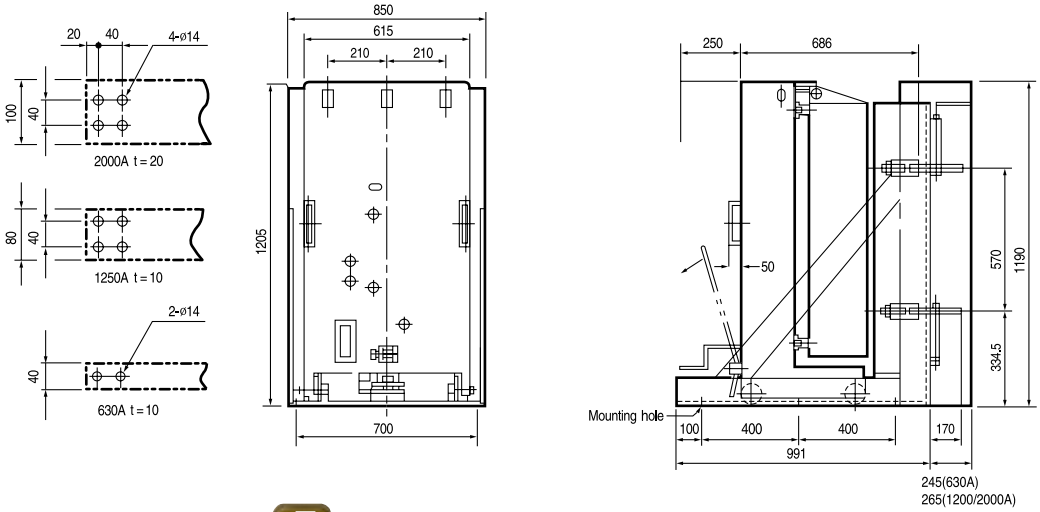
# External Dimensions

## 24kV 12.5/25kA 630/1250/2000A

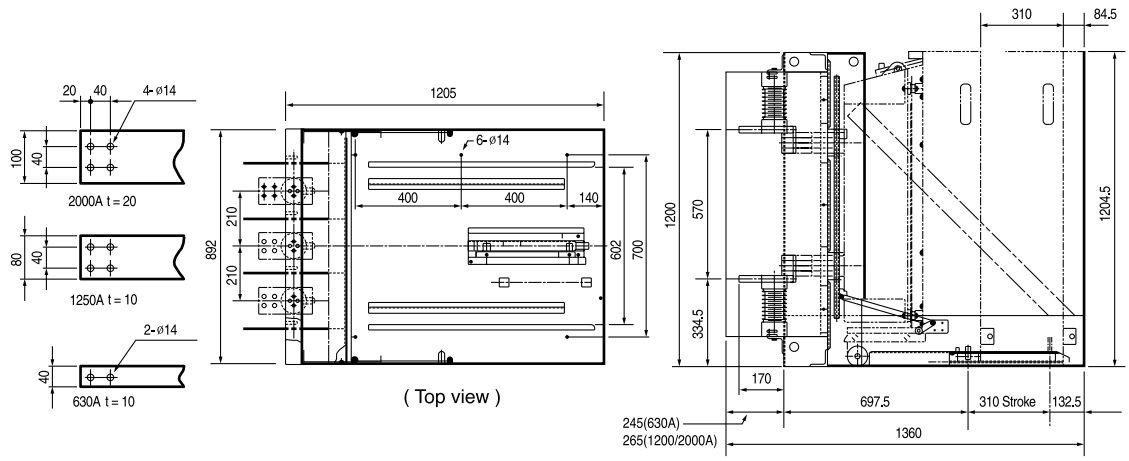
### P Type




### E Type




### F Type cradle

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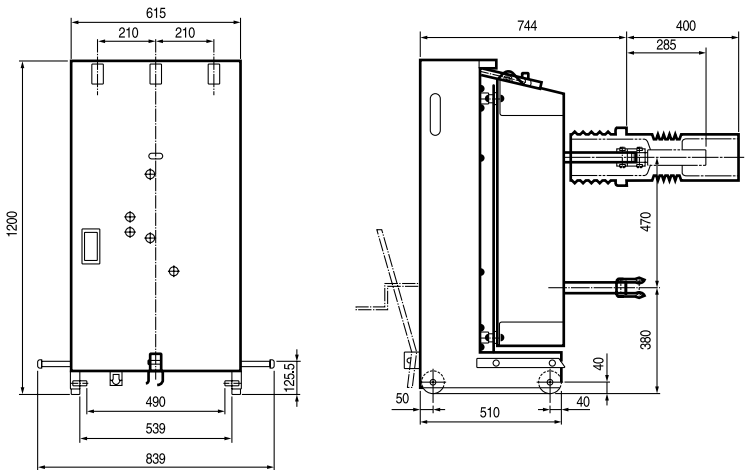
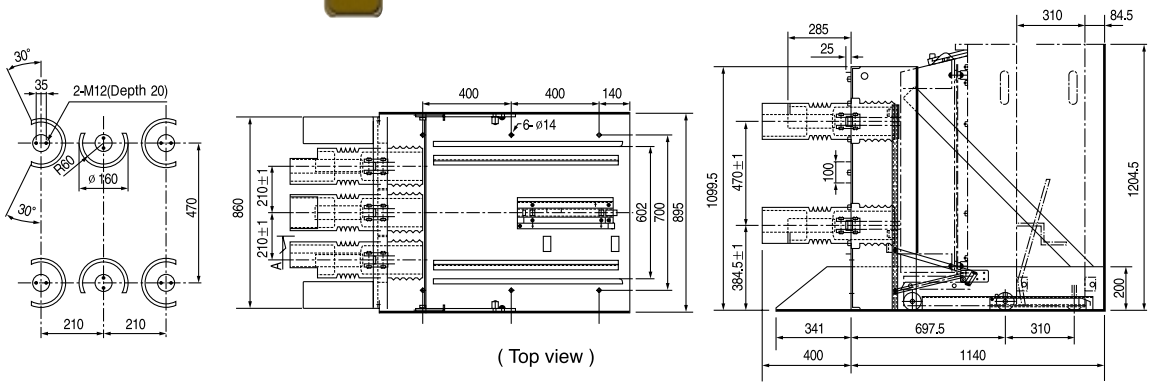
## G Type

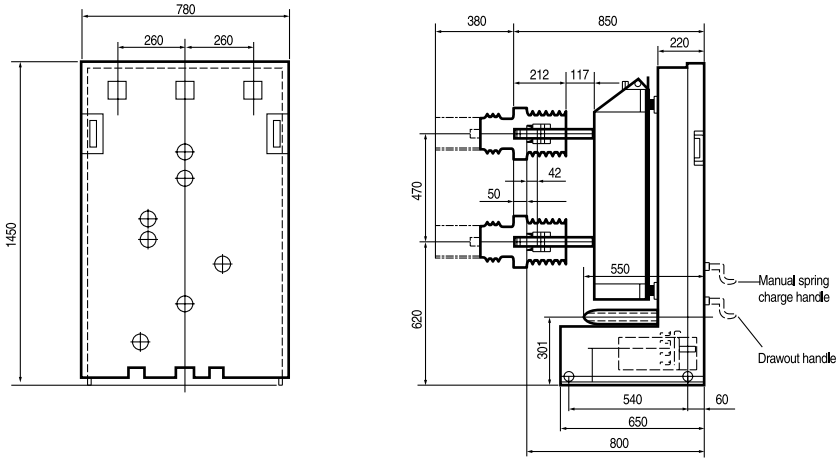



## G Type cradle




**25kV 25kA 600/2000A**

## M Type



# Ordering Information

## VCB

LVB – 06 G – 20 A / 06 1A 2A PS1

**LG VCB**

**Rated Voltage**
06 : 7.2kV
20 : 24kV
25 : 25.8kV

**Installation**
P : Fixed type
E : Drawout type with E class cradle
F : Drawout type with $F_2$ class cradle
G : Drawout type with G class cradle
M : Drawout type without cradle

**Interrupting Current**
8 : 8kA
13 : 12.5kA
20 : 20kA
25 : 25kA
32 : 31.5kA
40 : 40kA

**Revision No.**

**Rated Current**
04 : 400A
06 : 630A
12 : 1250A
20 : 2000A
30 : 3150A

**Control Voltage**
1A : DC 110V
1B : DC 220V
1C : DC 48V
1D : DC 24V
1E : DC 125V
1F : AC 100/110V
1G : AC 220V

**Position s/w**
PS1: 1a1b
PS2 : 2a2b

| Aux. s/w | | 7.2kV 8/12.5kA | 7.2kV 20~40kA | 24kV 12.5/25kA | 25.8kV 25kA |
|---|---|---|---|---|---|
| 2A | 2a2b | ○ | | | |
| 2B | 4a4b | ○ | | ○ | |
| 2C | 5a4b | | ○ | ○ | |
| 2D | 7a7b | | ○ | ○ | |
| 2E | 10a10b | | ○ | ○ | ○ |
| 2F | 5a5b | | | ○ | |

## CRADLE

LCL – 06 G – 20 A / 06 PS1

**LG Cradle**

**Rated Voltage**
06 : 7.2kV
20 : 24kV
25 : 25.8kV

**Installation**
E : Drawout type with E class cradle
F : Drawout type with $F_2$ class cradle
G : Drawout type with G class cradle

**Interrupting Current**
8 : 8kA
13 : 12.5kA
20 : 20kA
25 : 25kA
32 : 31.5kA
40 : 40kA

**Revision No.**

**Rated Current**
04 : 400A
06 : 630A
12 : 1250A
20 : 2000A
30 : 3150A

**Position s/w**
PS1: 1a1b
PS2 : 2a2b

Contents Index

# Ordering Sheet

## Circuit Breaker

| | | |
|---|---|---|
| **Rating** | | Voltage ( kV), Current ( A),<br>Frequency ( Hz),<br>Interrupting current ( kA) |
| **Mounting Type** | | ☐ P (Fixed type)<br>☐ E (Drawout type with E class cradle )<br>☐ F (Drawout type with $F_2$ class cradle )<br>☐ G (Drawout type with G class cradle )<br>☐ M (Drawout type without cradle ) |
| **Ratings of control voltage** | **Motor charging** | ☐ DC 110V |
| | **Close** | *☐ DC 220V *☐ DC 125V |
| | **Trip** | *☐ AC 100/110V *☐ AC 220V |

*Please contact manufacture when choosing this option.

## Operation & Accessories

| | | | |
|---|---|---|---|
| **Auxiliary s/w (AX)** | ☐ 2a2b | ☐ 4a4b | ☐ 5a4b |
| | ☐ 5a5b | ☐ 7a7b | ☐ 10a10b |
| | ☐ Other (_a _b) | | |
| **Condensor trip device** | ☐ Not needed | ☐ T1 | ☐ T2 |
| **Rectifier device** | ☐ Not needed | ☐ Needed | |
| **Position s/w** | ☐ Not needed | ☐ PS1 | ☐ PS2 |

✻When ordering, please include this sheet.

LG constantly endeavors to improve our products, so that information in this catalog is subject to change without notice.


**LG Industrial Systems Co., Ltd.**

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